

IN THE CLAIMS

Please find the claims to be in the form as follows:

Claim 1 (previously presented): An apparatus having a control circuit which comprises a feed forward filter arrangement and a controller, characterized in that the parameters of the feedforward filter arrangement and the parameters of the controller are adapted by an adaptation algorithm during operation of the apparatus.

Claim 2 (previously presented): An apparatus as claimed in Claim 1, characterized in that the adaptation algorithm is executed on a microprocessor, particularly a digital signal processor.

Claim 3 (previously presented): An apparatus as claimed in Claim 1 characterized in that said apparatus includes a disk for storage disk media, in which vibrations and internal disturbances which occur during operation of the apparatus are compensated by the adaptation algorithm optimizing the parameters of the feedforward filter arrangement and the parameters of the controller.

Claim 4 (previously presented): A method for responding to effects on precision of positioning of a scanning element in a disk drive, the method comprising:

- sensing forces acting the disk drive;
- converting detected forces into disturbance signals;
- applying the disturbance signals to a feed forward filter to obtain a disturbance variable;
- applying an adapted version of the disturbance signals as parameters to a controller;
- adjusting the disk drive for errors using the controller;
- receiving reference variables, error signals, and control variables at a processor;
- providing outputs from the processor to alter parameters of the feed forward filter and the controller.

Claim 5 (previously presented): The apparatus of claim 1, wherein the controller comprises

- an error signal input, for receiving error signals responsive to operation of a controlled

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device;

- an input for receiving adapted control parameters, relative to variations in type of external disturbances of the controlled device; and
- a control variable output for supplying signals for controlling the controlled device responsive to both the error signal and the adapted control parameters.

Claim 6 (previously presented): The apparatus of Claim 1 wherein the apparatus further comprises a storage media, in which vibrations and internal disturbances are compensated by the adaptation algorithm that adapts parameters of the feedforward filter arrangement, the parameters of the controller and the disturbance-variable feedforward.

Claim 7 (previously presented): The apparatus of Claim 6 wherein the feedforward filter arrangement receives a disturbance signal from sensors and further comprising the disturbance signal being received by a computational element that performs the adaptation algorithm, wherein the computational element employs a current position reference from a storage device and an error reference from the storage device to adapt parameters of the feedforward filter arrangement and the controller.

Claim 8 (previously presented): The apparatus of Claim 7 wherein the computational element that performs the adaptation algorithm employs at least one control variable from the controller to adapt parameters of the feedforward filter arrangement and the controller.

Claim 9 (previously presented): The apparatus of Claim 1 wherein the controller and the feedforward filter arrangement are responsive to external events including vibrations or temperature variations in components of the apparatus.

Claim 10 (previously presented): The method of Claim 4 wherein the step of applying the adapted version of the disturbance signals as parameters to the controller further comprises applying an adapted version of the disturbance signals as parameters to the feedforward filter.

Claim 11 (previously presented): The method of claim 10 wherein the step of providing outputs

from the processor to alter parameters of the feedforward filter and the controller employs reference variables, error signals, and control variables to alter parameters of the feedforward filter and the controller.

Claim 12 (previously presented): An apparatus for responding to effects on precision of positioning of a scanning element comprising:

- a control circuit having a feedforward filter arrangement;
- a controller;
- an adaptation algorithm;

wherein parameters of the feedforward filter arrangement and parameters of the controller are adapted by the adaptation algorithm during operation of the apparatus.

Claim 13 (previously presented): The apparatus of Claim 12 further comprising a computational element, wherein the computational element performs the adaptation algorithm.

Claim 14 (previously presented): The apparatus of Claim 12, wherein the controller comprises:

- an error signal input, for receiving error signals responsive to operation of a controlled device;
- an input for receiving adapted control parameters, relative to variations in external disturbances of the controlled device; and
- a control variable output for supplying signals for controlling the controlled device responsive to both the error signal and the adapted control parameters.

Claim 15 (previously presented): The apparatus of Claim 12 wherein the apparatus further comprises a storage media, in which vibrations and internal disturbances are compensated by the adaptation algorithm that adapts parameters of the feedforward filter arrangement, the parameters of the controller and the disturbance-variable feedforward.

Claim 16 (previously presented): The apparatus of Claim 15 wherein the feedforward filter arrangement receives a disturbance signal from sensors and further comprising the disturbance signal being received by a computational element that performs the adaptation algorithm,

wherein the computational element employs a current position reference from a storage device and an error reference from the storage device to adapt parameters of the feedforward filter arrangement and the controller.

Claim 17 (previously presented): The apparatus of Claim 16 wherein the computational element that performs the adaptation algorithm employs at least one control variable from the controller to adapt parameters of the feedforward filter arrangement and the controller.

Claim 18 (previously presented): The apparatus of Claim 12 wherein the controller and the feedforward filter arrangement are responsive to external events including vibrations or temperature variations in components of the apparatus.

Claim 19 (previously presented): An apparatus as claimed in Claim 12, wherein adaptation algorithm is executed by a digital signal processor.

Claim 20 (previously presented): An apparatus as claimed in Claim 12, wherein the apparatus includes disk drive for storage disk media, in which vibrations and internal disturbances which occur during operation of the apparatus are compensated by the adaptation algorithm optimizing the parameters of the feedforward filter arrangement and the parameters of the controller.